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MOTOR PROCESSES AND CONSCIOUSNESS[1]

IN view of the many different attempts which have been made to explain the relation between motor processes and consciousness, one can hardly be surprised if his own statements on this matter do not command universal acceptance. The problem is one which a large number of writers agree in regarding as the most important special problem in psychology at the present time, but the solutions differ widely. Perhaps the best way to meet one's critics under such circumstances is to turn critic oneself and examine the other views in the field and by such a comparative study exhibit the virtues, if there be any, of the position to which one is himself committed.

Among the first writers to emphasize the importance of motor processes as general conditions of consciousness were Dewey[2] and McDougall.[3] Dewey makes the statement that consciousness is conditioned by the action of the whole nervous arc, and not by any single section or part of the arc. Consciousness does not, therefore, depend merely upon sensory impulses; it is determined in character by the motor end of the process as well as by its sensory beginning. McDougall finds in new motor processes the chief conditions for the rise of consciousness. It is only when the individual is working out a readjustment in active response that consciousness arises.

These two general theories are both suggestive, but leave, even if they are accepted, all the details to be worked out by later investigation. We can not be satisfied with so broad a statement of the general relationship if the principle is to serve as a guide to concrete empiricism. To say with McDougall that new motor processes are the conditions of all consciousness leaves us with the necessity of showing how certain particular phases of consciousness are related to particular types of motor process. Suppose we say, for example, that the adjustments of the eyes in the visual perception of objects are important conditions for the rise of processes of recognition. We are still left with details unsolved as to the specific phase of the recognition process which is related to the sensory impressions on the retina and the specific phases of the process which are related to the motor element. We are simply called upon by McDougall's general formula to assume a broad parallelism between novel motor processes and consciousness. The same is true of Dewey's formula. To say that consciousness is related to the action of the whole reflex arc does not give us any definite answer to the question, What modification in consciousness will result from a modification in the motor outlet of a given stimulation? It is perfectly clear that like sensory stimulations do at different times pass through the central nervous system of an individual and emerge into the active organs through different channels. What is the effect upon conscious life of a modification in such cases of the avenue of motor discharge?

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[1] Earlier papers in this series were published in Vol. V., p. 676, and Vol. VI., p. 36, of this JOURNAL.

[2] Dewey, "The Reflex Arc Concept," pp. 358 ff., *Psychological Review,* 1896.

[3] McDougall, three articles in *Mind,* 1898.

Besides these general theories there are a large number of more specific theories. Thus Münsterberg holds[4] that the openness of the motor channels is always related to the vividness of consciousness, and that the direction of a motor discharge conditions its value. Royce[5] holds that ideas are always related to activities. He says: "Our mental images of outer objects are never to be divorced from our reactions." Baldwin[6] also makes the reaction phase of an idea the *general* characteristic. These writers have all contributed important examples of the relation between motor processes and special phases of consciousness, but what we miss in these special examples is an exhaustive account of the relation of all motor processes to consciousness. If it is true that ideas are determined in character by their motor relations, how much more must it be true that percepts and the immediate processes of recognition are determined by motor processes. If it is true that vividness and value are related to motor discharges, how much more must it be true that the concrete relationship between conscious elements such as we find in space relations is also dependent upon the direction of motor discharges. While we are justified in criticizing Dewey and McDougall as too general, we must criticize these writers because they have furnished us with formulas which are not comprehensive enough.

The formula needed is one which is at once comprehensive and capable of application in detail to specific cases of various kinds. Motor processes are evidently related to some very general aspect of consciousness, and yet this general aspect must in each particular case appear in some very definite, concrete manifestation. A phase of consciousness which is thus general and at the same time specific in its concrete manifestations is to be found in the fact of organization. Thus when all of the sensory elements of a given moment are organized into a single compact experience the special organization of the moment is a concrete specific fact, but it is a fact which exemplifies one of the most general and characteristic phases of consciousness. Thus when one has a sensation of red he relates this sensation to other phases of experience such as the background and the surroundings of the color in a definite, concrete manner. That he relates one element to the other factors of consciousness is an exhibition of the most characteristic fact in all mental life.

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[4] Chapter 15 on "Die Aktionstheorie," "Grundzüge der Psychologie," 1900.

[5] "Outlines of Psychology," p. 285 *passim.*

[6] "Mental Development," p. 313 *passim.*

The fact of mental organization is directly related to the fact of the individual's reaction. As has been repeatedly pointed out in earlier discussions, if one asks why a given sensation has value for an individual he can not find the answer to the question in any consideration of the quality or intensity of the sensation itself. The sensation is of value by virtue of the active adjustment to which it leads, and this active adjustment will in turn be related to the complex of experience into which the sensation enters. Thus we find ourselves discussing at once motor responses and facts of conscious organization. That the two groups of facts are closely related can be shown by an examination of specific cases, and thus we shall be able to give the general formula detailed content and at the same time verify the broader statements which refer to the universal importance of motor processes as conditions of all conscious organization.

In the two preceding papers of this series feelings and space perception have been discussed as specific examples of mental organizations related to motor processes. All that was there said to show the advantages of those special explanations can now be turned to account in favor of the general formula of the dependence of all types of organization upon motor processes.

A new example of the specific application of this general formula may be found in the solution which it offers of the difficult question, why there are within experience different degrees of unity. Thus, to use Professor James's illustration, we recognize for certain purposes the table as a unity and for other purposes we recognize the table as made up of legs and top, each of the parts being in itself a unity. Certainly the reason why experience breaks up at times into larger and at other times into smaller unities must be clearly understood before we can have any coherent account of mental organization.

One of the recent writers who has dealt with this problem without utilizing in any way the motor processes is Professor Dodge.[7] Professor Dodge is led to his discussion of unity by his experiments on ocular movements, which experiments seem to furnish evidence against the explanation of perceptual unity as dependent upon muscle sensation. For some time Professor Dodge has been pointing out the difficulties with the movement sensation theory in its various forms. He now comes to the constructive treatment of the problem and attempts to show that the various retinal elements are organized into unitary groups through similarity in their sensory processes or in the "life history" of neighboring nervous elements. Thus if an external object stimulates a certain part of the retina, the life history of a group of retinal elements excited by the object will have a unity which depends upon the physiological fact that these elements are for a period of time stimulated in like fashion.

This position does not differ very much from that earlier advocated by Lipps.[8] Lipps also looks for the unity of mental processes in the fact that neighboring points on the retina are frequently stimulated from objective sources in the same way.

Both of these writers find the unity of mental processes satisfactorily explained by the unity of the external sources of stimulation. It is not easy to understand how they have overlooked the fact that subjective unity is of a totally different type from objective unity. For example, in the illustration used by Professor James, it is quite possible for a given observer to treat the mass of sensory experiences which he receives from a given table in more than one way. The unity in this case changes according as the subjective motive is modified. Certainly no explanation that depends entirely upon external reality will serve to account for this shifting of the observer's interest and type of thought.

In the case of Lipps there is very definitely assumed back of the unity of the retinal processes a combining and unifying entity which utilizes the qualitative likenesses of the retinal processes. Professor Dodge does not refer explicitly in his discussion to any unifying subject which utilizes the like sensations that come from the retina, but it is obvious that without some such assumption mere likeness of the retinal processes would not serve as a bond between the different sensory elements of experience. And even if an integrating subject is assumed, we are forced to ask what motives there are in this subject's life which lead him to make up his experiences now on the one scale and again on another. When the matter is put in this form we see the advantage of recognizing that the subject is fully understood only when he is looked upon as conditioned in his concrete experiences by certain reactive tendencies which are radically different from the sensory elements which come from the outer world.

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[7] "An Experimental Study of Visual Fixation," *Psychological Review, Monograph Supplement*, No. 35, pp. 72 ff.

[8] *Psychologische Studien*, 1885, pp. 1 ff. And also "Grundthatsachen des Seelenlebens," pp. 515 ff.

There is large justification, as has been pointed out in an earlier discussion, for the statement that sensations are objective processes constantly presenting themselves to consciousness, but determined in their value for conscious life by considerations that grow out of the uses to which they are put. These uses are always related to behavior, which is the active and expressive side of the subject's life. If the motives of behavior are such as to lead the subject to react upon large sections of his environment, then the sensory elements from these larger sections of the environment will naturally be grouped together. We may say that this is in response to a subjective demand, but we have by our formula of reaction defined more fully the nature of the subjective demand. We have recognized the fact that the subject is himself a complex capable of scientific definition through a study of his special functions.

It is interesting to note in Professor Dodge's discussion that when he gives a figurative account of the way in which retinal elements come to act in unity he represents the different groups of retinal elements as bound together by what he calls "rings of twine" (p. 74). One is prompted to ask whether the pegs themselves which Professor Dodge uses in his illustration furnish the twine which binds them together, or whether this binding is done by some outside agent. If it is done by some outside agent, then obviously all of the earlier discussion of likeness in life history is irrelevant except in so far as it can be shown that the outside agent is interested in qualitative likeness in visual processes. If we attempt to show why the outside subject is interested in such likenesses we find ourselves confronted once more with the problem with which we started, and we certainly can not free ourselves from this unproductive circle by referring to the unity that exists in the objects which impress our senses. Physical science long ago pointed out that the whole scheme of physical organization differs radically from the appearances which present themselves in consciousness. The fundamental reason why individual experience is of value is that in this experience external agencies are reduced to a wholly new form of arrangement. The new arrangement is significant to the individual in his personal life, but has no objective value until it comes back into the world of things in the form of a reaction of the individual upon these things. Professor Dodge speaks in his discussion of the fact that behavior "standardizes" the group organization of various parts of the retina (p. 76). It is just this standardizing of the group organization which gives them permanence and value in subjective life. Why not recognize immediately that there is no fundamental distinction between standardizing and originating such an organization? Indeed it is very difficult to see how the process of standardizing could differ radically in character from the process of grouping itself. And certainly if any writer continues to use the two processes as separate, the burden of demonstrating the reason for two different kinds of processes rests with him.

The formula of activity which has been suggested as a solution for the problem raised by a critical examination of Dodge and Lipps has the widest application in explaining the diversities and harmonies in our conscious processes of recognition. Whenever we recognize two seen things as alike, we must attribute the recognized likeness not to the identity of retinal excitations, but rather to the fact that whatever may be the retinal cue, the reaction in the two cases is of the same type. We never see the same object twice in succession from the same point of view, and we never get from any object the same group of sensations. With every motion of the eye there is a shifting of the relation between the sensory facts of experience. And certainly with every one of the grosser bodily movements there is a complete breaking up of the sensory arrangement of the situation. We accept these fluctuations in sensation without the slightest disturbance of our personal lives. It is not important that we should discriminate minutely just how much of a person's face we can see, or just how much of the outline of a familiar object falls upon the retina. Anything will do which gives us a cue for the right action. In our discussion of perception it was pointed out that we do not fill in the sensory elements in the blind spot, or in the misprinted word; we simply utilize the deficient sensory experience in terms of our highly organized methods of response.

What is true in dealing with processes of perceptual recognition is strikingly evident when we come to deal with ideas. Here is a sphere of experience in which, as Royce and Baldwin have pointed out, the active processes are of first-class importance. Different individuals have the greatest variety of mental images which they retain in memory from their contact with the objects in the world about them, and yet there is a certain agreement in their modes of behavior whenever one of these ideas is called up through association. So also with the different periods of individual experience. The important fact in defining the psychological character of a general idea is not that we should always discover like elements in the different examples of this general idea; it is important only that whatever the image in experience, the reaction shall always be the same. The reaction may get itself systematized in developed human experience into the mere act of articulation, or it may be an elaborate process of adjustment to practical demands. In any case the motor phase of the process is general and subjective in its character, while the content factors are particular and in themselves unorganized.

Unity of percepts and unity of ideas are accordingly phrases which describe an aspect of consciousness dependent on motor tendencies. Unity may be of various different kinds in different concrete cases; the formula is thus capable of bringing together under a single principle many different facts. Unity is, on the other hand, always a manifestation of the essential organizing tendency of mental life. We see, therefore, how this explanatory formula meets the demand which was expressed at the outset for a general formula which shall at the same time serve to guide in a detailed account of mental processes.

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SOCIETIES

THE SEVENTEENTH ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE seventeenth annual meeting of the American Psychological Association was held in Levering Hall of the Johns Hopkins University on Tuesday, Wednesday, and Thursday, December 29, 30, and 31, 1908. This was convocation week of the American Association for the Advancement of Science, and a notable company of scientific men, variously estimated at from two thousand to twenty-five hundred in number, were attracted to Baltimore by the programs of the society and the numerous organizations affiliated with it. If these numbers are a gauge of scientific activity, there is reason for abundant optimism regarding the status of research in America, for at no previous time have so many men of science been gathered together. The question has been repeatedly raised, however, whether the real aims of the scientific societies are best furthered by these large meetings with their surfeit of attractive programs, or whether a desirable concentration of interest is not secured by holding the sessions of the several societies in different cities.

This question was a live issue before the Psychological Association when the choice of the next place of meeting came up for discussion. Some of the members advocated segregation, and urged the acceptance of the invitation to go to New Haven, where the American